

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

CONSERVATION CROP ROTATION

(Acre)
CODE 328

DEFINITION

Growing crops in a recurring sequence on the same field.

PURPOSES

This practice may be applied as part of a conservation management system to support one or more of the following:

- Reduce sheet and rill erosion.
- Reduce irrigation induced erosion.
- Reduce soil erosion from wind.
- Maintain or improve soil organic matter content.
- Manage deficient or excess plant nutrients.
- Improve water use efficiency.
- Manage plant pests (weeds, insects, diseases).
- Provide food for domestic livestock.
- Provide food and cover for wildlife.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all cropland and other land where crops are grown.

This standard does not apply to pastureland, hayland, or other land uses where annual row or close growing crops are grown to facilitate renovation or reestablishment of perennial vegetation. It does not apply to land devoted to orchards, vineyards, or nurseries.

CRITERIA

General Criteria Applicable To All Purposes Named Above

Crops shall be grown in a planned, recurring sequence except as outlined in the Operation and Maintenance Section.

Adapted crops and varieties shall be selected.

A conservation crop rotation may include crops planted for cover or nutrient enhancement.

Nutrient and pest management will be applied according to NRCS Practice Standards Code 590 and 595.

Additional Criteria To Reduce Sheet And Rill Erosion

Selected crops shall produce enough above and below ground biomass to control erosion within the soil loss tolerance (T) or other planned soil loss objective meeting quality criteria in Section III of the Field Office Technical Guide (FOTG).

The amount of biomass needed shall be determined using the Revised Universal Soil Loss Equation (RUSLE). Soil loss calculations shall account for the effects of other practices in the conservation management system. Procedures are found in the Florida Agronomy Field Handbook (FAFH) and Field Office Computing System (FOCS), RUSLE.

Additional Criteria To Reduce Irrigation Induced Erosion

To reduce erosion in furrows, crops or cover crops shall be selected that are grown within the wetted perimeter of the furrow, or produce the amount of residue needed to be maintained in the furrow to achieve the soil loss objective.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

To reduce erosion induced by sprinkler irrigation, crops or cover crops shall be selected that develop surface cover or canopy rapidly, or produce the amount of residue needed to achieve the soil loss objective.

The amount of residue needed may be determined by approved research. The Florida Irrigation Guide may be used as a guide to meet this criteria.

Additional Criteria To Reduce Soil Erosion From Wind

Crops shall be selected that produce adequate biomass, at the appropriate time, to control erosion to within the soil loss tolerance (T), crop tolerance, improve air quality or other planned soil loss objective.

The amount of biomass needed shall be determined using current approved wind erosion prediction technology. Procedures are found in the FAFH and FOCS, Wind Erosion Equation (WEQ). Calculations shall account for the effects of other practices in the conservation management system.

Additional Criteria To Maintain Or Improve Soil Organic Matter Content

Crops shall be selected that produce adequate biomass to maintain soil organic matter content, as determined using the current approved Soil Conditioning Index Procedure. Procedures are found in the FAFH.

If partial removal of residue by means such as baling or grazing occurs, enough residue shall be maintained to achieve the planned soil organic matter content.

Cover and green manure crops planted specifically for soil improvement may be grazed, as long as grazing is managed to retain adequate biomass.

Additional Criteria To Manage Deficient Or Excess Plant Nutrients

Crop selection and sequence shall be determined using a nutrient balance procedure. FAFH and Agricultural Waste Management Field Handbook (AWMFH) may be used to develop the selection and sequence.

When crop rotations are designed to add nitrogen to the system, nitrogen-fixing crops shall be grown

immediately prior to or interplanted with nitrogen-depleting crops.

To reduce excess nutrients, crops or cover crops having rooting depths and nutrient requirements that utilize the excess nutrients shall be grown.

Additional Criteria To Improve Water Use Efficiency

Selection of crops and varieties, sequence of crops, or the annual decision weather to plant a crop, shall be determined using water balance procedures. Where irrigation is used, apply irrigation water management in accordance with NRCS Practice Standard Irrigation Water Management, Code 449.

Additional Criteria To Manage Plant Pests (Weeds, Insects, Diseases)

Crops shall be alternated to break the pest cycle and/or allow for the use of a variety of other control methods. Affected crops and alternate host crops shall be removed from the rotation for the period of time needed to break the life cycle of the targeted pest.

Resistant varieties shall be selected where there is a history of a pest problem. Publications from universities may be used as a source for these varieties.

Additional Criteria To Provide Food For Domestic Livestock

Crops shall be selected to balance the feed supply with livestock needs. The needed amount of selected crops shall be determined using an approved forage-livestock balance procedure such as Grazing Land Application software (GLA).

Additional Criteria To Provide Food And Cover For Wildlife

Selection of crops will be consistent with the supplement to the wildlife standard and specifications for Florida, *Management For Wildlife*.

CONSIDERATIONS

When used in combination with Stripcropping (code 585 or code 586), the crop sequence should be consistent with the stripcropping design.

When used in combination with residue management practices, selection of high residue

producing crops and varieties, use of cover crops, and adjustment of plant population and row spacing can enhance production of the kind, amount, and distribution of residue needed.

Where irrigation caused erosion of furrows is a concern, consider changing method of application to subsurface applied or trickle system.

Where erosion induced by sprinkler irrigation is a concern, the hazard can be reduced by contour farming, contour stripcropping, or conservation tillage.

Where maintaining or improving soil organic matter content is an objective, the effects of this practice can be enhanced by managing crop residues, utilizing animal wastes, or applying mulches to supplement the crop biomass.

Where excess plant nutrients or soil contaminants are a concern, rotating deep rooted crops or cover crops with shallow rooted crops can help recover the nutrient or contaminant from the soil profile.

Where precipitation is limited, seasonal or erratic, moisture can be conserved for crop use by maintaining crop residues on the soil surface to increase infiltration and to reduce runoff and evaporation. Where improving water use efficiency on deep soils is a concern, rotating deep-rooted crops with shallow rooted crops can help utilize all available water in the soil profile.

Crop damage by wind erosion can be reduced by selecting crops, which are tolerant to abrasion from wind blown soil or tolerant to high wind velocity. If crops sensitive to wind erosion damage are grown, potential plant damage can be reduced by crop residue management, field windbreaks, herbaceous wind barriers, intercropping, or other methods of wind erosion control.

Soil compaction can be reduced when rotations including deep rooted crops (able to extend to and penetrate the compacted soil layers) are used in combination with deep tillage, controlled traffic, or management of grazing animals to prevent, or breakup, compacted layers.

PLANS AND SPECIFICATIONS

Specifications for establishment and operation of this practice shall be prepared for each field or

treatment unit according to the Criteria, Considerations, and Operation & Maintenance described in this standard.

Specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation. Examples of these records are found in the FAFH.

OPERATION AND MAINTENANCE

Operation and maintenance will consist of rotations that will provide for acceptable substitute crops in case of crop failure or shift in planting intentions for weather related or economic reasons. Acceptable substitutes are crops having similar properties that meet the criteria for all the resource concerns identified for the field or treatment unit.

REFERENCES

- Section III, FOTG
- Florida Agronomy Field Handbook
- *Management For Wildlife* (A supplement to Wildlife Standard and Specifications for Florida)
- Florida Irrigation Guide
- Agricultural Waste Management Field Handbook
- Field Office Computing System